IN THE CLAIMS

1. (Original) A method for making a porous sol-gel fiber, the method comprising the steps of:

hydrolyzing a silicate ester with water using a catalyst to form a hydrolyzed solution;

transferring the hydrolyzed solution into the cavity of a mold;

allowing the hydrolyzed solution to gelatinize to form a sol-gel fiber;

removing the sol-gel fiber from the mold; and

drying the sol-gel fiber.

2. (Original) The method of Claim 1, wherein the silicate ester is tetramethyl orthosilicate or tetraethyl orthosilicate.

3. (Original) The method of Claim 1, wherein the volume ratio of the silicate ester to water is 2 or less.

4. (Original) The method of Claim 1, wherein the catalyst is a mineral acid catalyst.

5. (Original) The method of Claim 1, wherein the mold cavity is a tubular cavity.

6. (Original) The method of Claim 1, wherein the hydrolyzed solution is allowed to gelatinize for at least two days.

7. (Original) The method of Claim 1, wherein the sol-gel fiber is removed from the mold by injecting a fluid into the mold.

8. (Original) The method of Claim 1, wherein the drying step comprises allowing the sol-gel fiber to air dry.

9. (Original) The method of Claim 1, further comprising a step of incorporating a sensing material into the sol-gel fiber.

10. (Original) The method of Claim 9, wherein the sensing material is added to the water used for the hydrolysis.

11. (Original) The method of Claim 9, wherein the sensing material is added to the hydrolyzed solution.

12. (Original) The method of Claim 9, wherein the sensing material is absorbed into the sol-gel fiber by dipping the sol-gel fiber into a solution comprising the sensing material.

13. (Original) The method of Claim 9, wherein the sensing material is optically changeable in the presence of water.

14. (Original) The method of Claim 9, wherein the sensing material is optically changeable in the presence of ammonia.

15. (Original) The method of Claim 9, wherein the sensing material is $CoCl_2$ or $CuCl_2$.

16. (Original) A porous sol gel fiber made by the method of Claim 1.

17. (Original) A porous sol gel fiber made by the method of Claim 9.

18. (Original) The porous sel-gel fiber of Claim 17, further comprising a cladding material disposed on the fiber.

19. (Original) The porous sol-gel fiber of Claim 17, wherein the sensing material is $CoCl_2$ or $CuCl_2$.

20. (Original) A method for constructing an optical fiber sensor, the method comprising the steps of:

hydrolyzing a silicate ester with water using a catalyst to form a hydrolyzed solution;

transferring the hydrolyzed solution into the cavity of a mold;

allowing the hydrolyzed solution to gelatinize to form a sol-gel fiber;

removing the sol-gel fiber from the mold;

drying the sol-gel fiber; and

positioning the sol-gel fiber between a light source and a light detector.

21. (Original) The method of Claim 20, further comprising a step of incorporating a sensing material into the sol-gel fiber.

22. (Currently Amended) The method of Claim 21, wherein the sensing material is optically changeable in the presence of moisture or ammonia.

23. (Original) The method of Claim 20, wherein the diameter of the air dried sol-gel fiber is about 500 μm or less.

24. (Original) The method of Claim 20, wherein the length of the air dried sol-gel fiber is at least 1 mm.

25. (Original) The method of Claim 21, wherein the sensing material is optically changeable in the presence of water.

26. (Original) An optical fiber sensor comprising:

a light source;

a light detector; and

a transducer;

wherein the transducer comprises the porous sol-gel fiber of Claim 17 and wherein light from the light source passes through the transducer and impinges on the light detector.

27. (Original) The optical fiber sensor of Claim 26, further comprising a lens positioned between the light source and the transducer wherein light from the light source is focused by the lens before passing through the transducer.

28. (Original) The optical fiber sensor of Claim 26, further comprising a first optical fiber positioned between the lens and the transducer, wherein the first optical fiber is optically coupled to a first end of the transducer such that light from the light source passes through the first optical fiber before passing through the transducer.

29. (Original) The optical fiber sensor of Claim 26, further comprising a second optical fiber positioned between the transducer and the light detector, wherein the second optical fiber is optically coupled to a second end of the transducer such that light passing through the transducer passes through the second optical fiber before impinging on the light detector.

30. (Original) The optical fiber sensor of Claim 26, further comprising a data acquisition system in communication with the light detector.

31. (Original) The optical fiber sensor of Claim 30, wherein the data acquisition system comprises a computer for analyzing data generated by the light detector.

32. (Original) The optical fiber sensor of Claim 26, wherein the light source is: a line source; a band source; or a continuous light source coupled with a monochromator or band-pass filter.

33. (Original) The optical fiber sensor of Claim 26, wherein the light detector is a photodiode, a photomultiplier tube or a charge coupled detector.

34. (Original) The optical fiber sensor of Claim 26, wherein the transducer is positioned inside a chamber.

35. (Original) The optical fiber sensor of Claim 34, wherein the chamber comprises an inlet and an outlet such that a fluid flowing into the chamber through the inlet contacts the transducer and exits the chamber through the outlet.

36. (Original) The optical fiber sensor of Claim 35, further comprising:

a first optical fiber which passes through a first opening in the chamber and is optically coupled to a first end of the transducer inside the chamber such that light from the light source passes through the first optical fiber before passing through the transducer; and

a second optical fiber which is optically coupled to a second end of the transducer inside the chamber and which passes through a second opening in the chamber such that light passing

through the transducer passes through the second optical fiber before impinging on the light detector.

37. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 26, the method comprising steps of:

contacting the transducer with the sample fluid; and

monitoring the signal from the light detector while directing light from the light source through the transducer.

38. (Original) The method of Claim 37, wherein the contacting step comprises positioning the transducer in the sample fluid.

39. (Original) The method of Claim 37, wherein the dopant in the sol-gel fiber interacts with the analyte.

40. (Original) The method of Claim 39, wherein the monitoring step comprises monitoring the absorbance of the analyte.

41. (Original) The method of Claim 39, wherein the dopant forms a complex with the analyte.

42. (Original) The method of Claim 41, wherein the monitoring step comprises monitoring absorbance of the complex or fluorescent emissions of the complex.

43. (Original) The method of Claim 37, wherein the signal from the light detector is compared to a calibration curve to determine the amount of analyte in the sample.

44. (Original) The method of Claim 43, wherein the calibration curve is generated by a process comprising steps of:

contacting the transducer with a first fluid sample having a known concentration of analyte;

monitoring the signal from the light detector while directing light through the transducer to generate a first data point;

contacting the transducer with a second fluid sample having a known concentration of analyte different than the first fluid sample;

monitoring the signal from the light detector while directing light through the transducer to generate a second data point;

optionally generating additional data points using additional fluid samples having known concentrations of the analyte; and

fitting a curve to the data points to generate the calibration curve.

45. (Original) The method of Claim 37, wherein the analyte is ammonia and the sensing material is $CuCl_2$, the method further comprising a step of exposing the sol-gel fiber to a solution comprising hydrochloric acid after the monitoring step to reset the sensor.

46. (Original) An optical fiber sensor comprising:

a light detector; and

a transducer in optical communication with the light detector such that light generated within the transducer impinges on the light detector;

wherein the transducer comprises the porous sol-gel fiber of Claim 17.

47. (Original) The optical fiber sensor of Claim 46, further comprising a light source, wherein light from the light source impinges on a surface of the transducer.

48. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 46, the method comprising steps of:

contacting the transducer with the sample fluid; and

monitoring the signal from the light detector.

49. (Original) A method for determining the presence or concentration of an analyte in a sample fluid using the sensor of Claim 47, the method comprising steps of:

contacting the transducer with the sample fluid; and

monitoring the signal from the light detector while applying light to the surface of the transducer.